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D902

(56) Documents Cited

GB 2245618 A GB 2238559 A

(58) Field of Search

UK CL (Edition M) E1D DLEKH DLEKN DLEQWDV
DLEQWSV DLEQWSW
INT CL⁵ E04D

(54) Corrugated metal sheet, e.g. for roofing

(57) A corrugated metal sheet comprises a metal sheet provided at two opposite sides thereof with an insertion cap 21 and an insertion seat 41, 43. Two or more corrugated metal sheets are joined together side by side by fastening the insertion cap 21 of one corrugated metal sheet with the insertion seat 41, 43 of another corrugated metal sheet. The corrugated metal sheet is further provided with a predetermined number of ridges located between the insertion seat and the insertion cap. The insertion seat of the sheet 5 is screwed to a purlin 60 by screws 54, 52, at the edge 44 and centre 42 respectively of the insertion seat.

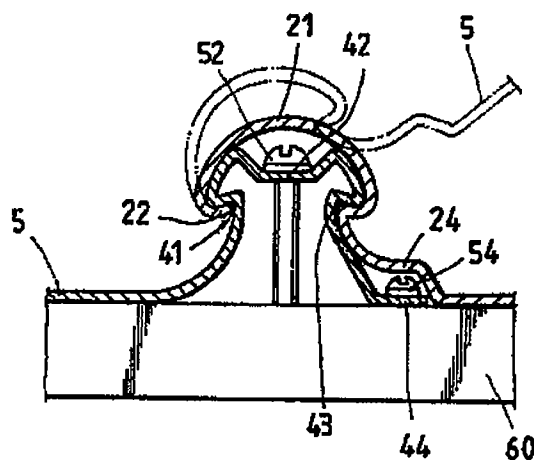


FIG. 4

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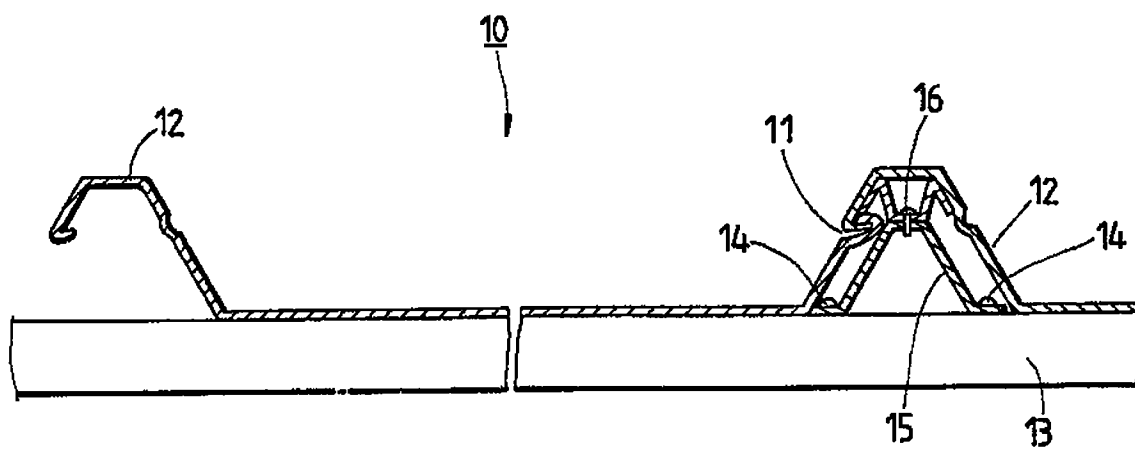


FIG. 1
PRIOR ART

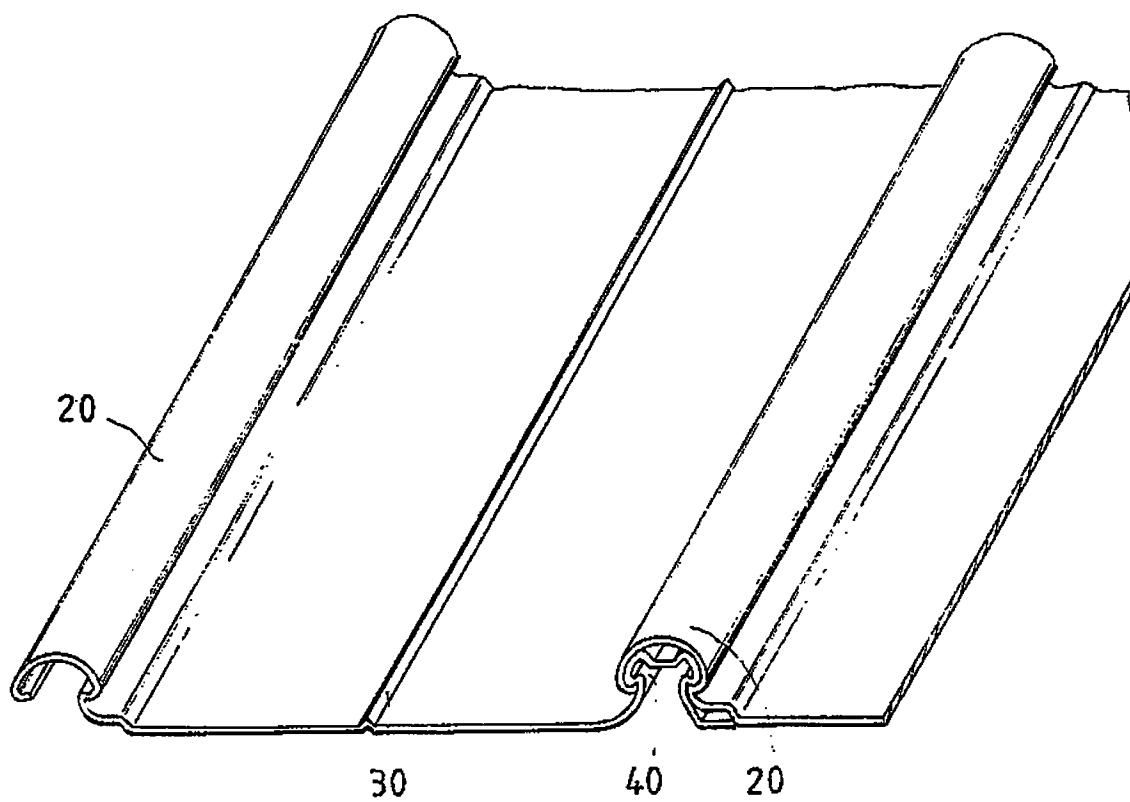


FIG. 2

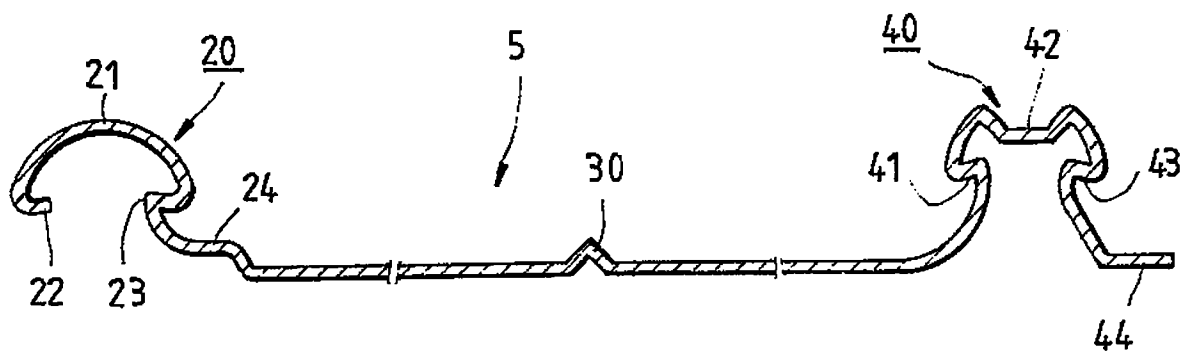


FIG. 3

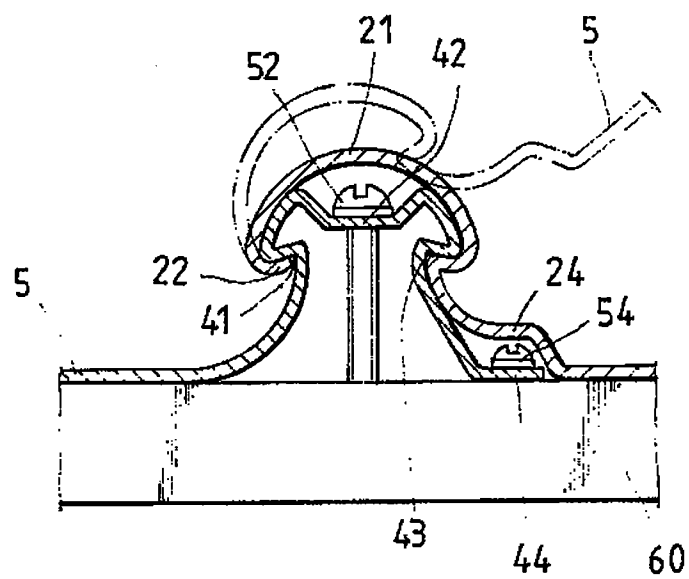


FIG. 4

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TITLE - CORRUGATED METAL PLATE

The present invention relates generally to a corrugated metal plate, and more particularly to a corrugated metal plate having an improved connection means.

Corrugated metal plates are light in weight and can be made economically. As a result, they are widely used in building factories, gymnasiums, auditoriums, residential buildings, warehouses, etc.

As shown in FIG. 1, a conventional corrugated metal plate 10 is provided at one side thereof with a fastening seat 11 and at another side thereof with an insertion cap

12. In the processing of combining the corrugated metal plates 10, a saddle seat 15 is fastened by means of a screw 14 on a steel purlin 13 located at the connection point between two corrugated metal plates 10. The saddle seat 15 is urged by the fastening seat 11 of the corrugated metal plate 10 such that the saddle seat 15 and the fastening seat 11 are fastened by a screw 16. The insertion cap 12 of another corrugated metal plate 10 is retained by the fastening seat 11. The conventional connecting structure of the corrugated metal plate 10 described above has inherent shortcomings, which are expounded explicitly hereinafter.

It is costly and time-consuming to use the saddle seat 15 to support and fasten the connecting structure of the corrugated metal plates 10.

The fastening effect between the fastening seat 11 and the saddle seat 15 can be easily undermined by the corrugated metal plates 10 which are susceptible to expansion and contraction caused by the climatic factors, such as temperature fluctuation, sunlight, wind, rain, etc. In other words, the screws 14 and 16 which are used to fasten the fastening seat 11 and the saddle seat 15 are vulnerable to becoming loosened. Once the screws 14 and 16 have become loosened, the threaded holes, in which the screws 14 and 16 are received, are prone to an abrasion

caused by oxidation, thereby resulting in a reduction in the service life span of the corrugated metal plates 10.

It is therefore the primary objective of the present invention to provide simple and economic connecting means of the corrugated metal plates.

It is another objective of the present invention to provide the corrugated metal plates with connecting means having a fastening effect which can not be undermined by the climatic factors.

In keeping with the principle of the present invention, the foregoing objectives of the present invention are attained by a corrugated metal plate, which includes an insertion seat and an insertion cap. The insertion seat and the insertion cap are integral parts of a corrugated metal plate and are disposed respectively at two opposite sides of the corrugated metal plate. Two corrugated metal plates are fastened together side by side by fastening the insertion cap of one corrugated metal plate with the insertion seat of another corrugated metal plate.

The foregoing objectives, features, functions and advantages of the present invention will be more readily understood upon a thoughtful deliberation of the following detailed description of the present invention in conjunction with the accompanying drawings.

FIG. 1 shows a sectional schematic view of a prior art connecting means of the corrugated metal plates.

FIG. 2 shows a perspective view of two corrugated metal plates in combination according to the present invention.

FIG. 3 shows a sectional schematic view of two corrugated metal plates in combination according to the present invention.

FIG. 4 shows a sectional schematic view of a connecting means of the corrugated metal plates according to the present invention.

As shown in FIGS. 2-4, a corrugated metal plate 5 of the present invention is integrally made of a colored steel plate by rolling. Located at two opposite sides of the corrugated metal plate 5 are an insertion cap 20 and an insertion seat 40, which are parallel to each other. Located at the midsegment of the upper surface of the corrugated metal plate 5 is a ridge 30. The insertion cap 20 has a top portion 21, which is similar in shape to a mushroom cap and is provided at one end of the base thereof with a first retaining portion 22 of a hooklike construction. The top portion 21 is further provided with a second retaining portion 23, which is opposite in location to the first retaining portion 22. The second retaining portion 23 has one end, which extends inwards in the direction toward the ridge 30 to form a rib 23 of an arcuate construction. The rib 23 is located at a level higher than that of the upper surface of the corrugated metal plate 5. The insertion seat 40 is provided centrally at the top thereof with an upper supporting surface 42. Located at one end of the base of the insertion seat 40 is a first retaining slot 41, which faces inwards in the direction toward the ridge 30. The insertion seat 40 is further provided with a second retaining slot 43 opposite in location to the first retaining slot 41. The second retaining slot 43 has one end which extends downward to form a lower supporting surface 44 which is located at the same level as the upper surface of the corrugated metal

plate 5 and is provided longitudinally with a predetermined number of screw holes (not shown in the drawings) for receiving therein a predetermined number of screws which are used to fasten the corrugated metal plate 5 to a steel purlin 60.

As shown in FIG. 4, a first corrugated metal plate 5 is fastened to the steel purlin 60 by means of screws 52 and 54 which are fastened respectively onto the purlin 60 via the screw holes of the upper supporting surface 42 and the lower supporting surface 44. A second corrugated metal plate 5 is joined with the first corrugated metal plate 5 such that the first retaining portion 22 of the insertion cap 20 of the second corrugated metal plate 5 is retained securely in the first retaining slot 41 of the insertion seat 40, and that the second retaining portion 23 of the insertion cap 20 of the second corrugated metal plate 5 is retained securely in the second retaining slot 43 of the insertion seat 40, and further that the insertion seat 40 is enclosed in the interior of the top portion 21 of the insertion cap 20, as shown in FIG. 4. It must be noted here that the screw 54 is fastened onto the purlin 60 in such a manner that the head of the screw 54 remains under the rib 24 of the insertion cap 20 without interfering the insertion cap 20.

The corrugated metal plate 5 of the present invention is further provided with the ridge 30, which serves to

lessen the impact of the temperature fluctuations on the corrugated metal plate 5 and to prevent the screw 52 from becoming loosened. As a result, the service life span of the corrugated metal plate 5 of the present invention is effectively prolonged. In addition, the umbrellalike top portion 21 of the insertion cap 20 gives an added esthetic effect to the corrugated metal plate 5 of the present invention and serves to lessen the impact of rain or wind on the corrugated metal plate 5 of the present invention.

The corrugated metal plate of the present invention has several inherent advantages, which are summed up hereinafter.

The corrugated metal plates of the present invention can be joined together easily and rapidly.

The corrugated metal plate of the present invention is provided with connection means devoid of a saddle seat of the prior art and can be therefore worked on easily and economically.

The corrugated metal plate of the present invention is provided with an umbrellalike insertion cap which serves to enhance the esthetic effect of the corrugated metal plate of the present invention and which serves to lessen effectively the wind resistance of the corrugated metal plate of the

present invention and to prevent the stress concentration of the corrugated metal plate of the present invention.

The corrugated metal plate of the present invention is provided with the insertion seat and the insertion cap, which are curved appropriately to lessen the impact of the temperature fluctuations on the corrugated metal plate of the present invention.

The corrugated metal plate of the present invention is provided at the midsegment thereof with a ridge, which serves to minimize the adverse impact of the temperature fluctuations of the fastening effect of the screw of the corrugated metal plate of the present invention.

The embodiment of the present invention described above is to be regarded in all respects as merely illustrative and not restrictive. Accordingly, the present invention may be embodied in other specific forms without deviating from the spirit thereof. The present invention is therefore to be limited only by the scope of the following appended claims.

CLAIMS

1. A corrugated metal plate comprising a metal plate which is provided integrally at one side thereof with an insertion cap and is further provided integrally at another side thereof with an insertion seat; wherein said insertion cap comprises an umbrellalike top portion having a base provided at one side thereof with a first retaining portion and at another side thereof with a second retaining portion which has one end extending downwards in the direction toward the middle of said metal plate to form a rib located at a level higher than an upper surface of said metal plate; wherein said insertion seat is provided centrally at a top thereof with an upper supporting surface which has one end extending downwards in the direction toward said middle of said metal plate to form a first retaining slot engageable with said first retaining portion of said insertion cap of another one of said metal plate, said upper supporting surface further having another end extending downwards in the direction opposite to said first retaining slot to form a second retaining slot engageable with said second retaining portion of said insertion cap of another one of said metal plate, said second retaining slot having one end extending downwards in the direction opposite to said middle of said metal plate to form a lower supporting surface located at the same level as said upper surface of said metal plate; and wherein said upper supporting surface and

said lower supporting surface of said insertion seat are provided respectively with a fastening hole dimensioned to receive therethrough a fastening means which is fastened onto a purlin to which said metal plate is fastened securely.

2. The corrugated metal plate according to claim 1 wherein said metal plate is provided with a predetermined number of ridges located between said insertion cap and said insertion seat.

3. A corrugated metal plate substantially as herein described with reference to and as illustrated in Figures 2 to 4 of the accompanying drawings.

Relevant Technical Fields

(i) UK Cl (Ed.M) E1D (DLEQWDV, DLEQWSW, DLEQWSV, DLEKH, DLEKN)

(ii) Int Cl (Ed.5) E04D

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Search Examiner
 J D CANTRELL

Date of completion of Search
 11 OCTOBER 1996

Documents considered relevant
 following a search in respect of
 Claims :-
 1 TO 3

Categories of documents

- | | |
|---|---|
| X: Document indicating lack of novelty or of inventive step. | P: Document published on or after the declared priority date but before the filing date of the present application. |
| Y: Document indicating lack of inventive step if combined with one or more other documents of the same category. | E: Patent document published on or after, but with priority date earlier than, the filing date of the present application. |
| A: Document indicating technological background and/or state of the art. | &: Member of the same patent family; corresponding document. |

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2245618 A (EUROCLAD)	1, 2
X	GB 2238559 A (BROHOME)	1, 2

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents)